REPORT OF COMPLIANCE SAMPLING INSPECTION

OF THE

ROCKAWAY BEACH WASTEWATER TREATMENT FACILITY

IN

ROCKAWAY BEACH, MISSOURI

NPDES PERMIT NUMBER: MO-0108162

SEPTEMBER 10-13, 2007

BY

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region VII
Environmental Services Division

INTRODUCTION

At the request of the Water, Wetlands, and Pesticides Division, Water Enforcement Branch, a Compliance Sampling Inspection was performed at the Rockaway Beach Treatment Facility (WWTF) in Rockaway Beach, Missouri on September 10-13, 2007. This inspection was performed under the authority of Section 308(a) of the Federal Water Pollution Control Act, as amended. This narrative report and attachments present the results of this inspection.

PARTICIPANTS

City of Rockaway Beach:
- Lawrence E. Cline, Mayor
- Edwin (Buck) K. Godley, Plant Operator
- Sue Riggs, Alderlady

Missouri Department of Natural Resources (MDNR)
Southwest Regional Office:
- Greg Perkins, P.E., Environmental Engineer
- Ernest (E.C.) West, Water Specialist
- Joshua L. Grosvenor, E.I.T., Environmental Engineer

U.S. Environmental Protection Agency (EPA):
- Joseph Joslin, Environmental Engineer

INSPECTION PROCEDURES

Facility personnel were not notified prior to the inspection. On September 10, 2007, I arrived at the Rockaway Beach Wastewater Treatment Facility (WWTF) at 11:00 a.m. I introduced myself to Mr. Godley, explained the purpose of the inspection, and requested a brief tour of the plant. I began the inspection in the afternoon. I notified Mr. Godley that Missouri Department of Natural Resources (MDNR) personnel would be with me on Tuesday morning for a detailed tour of the plant.

FACILITY DESCRIPTION

The Rockaway Beach WWTF is located at 1000 Boys Camp Road in Rockaway Beach, Missouri (Location Map, Attachment 1). The facility has two influent flow metering stations followed by a lift station. The wastewater, combined with the return activated sludge, is pumped to a two basin, mixed anoxic zone which is followed by a mechanical bar screen operated in parallel with a standby manually cleaned bar screen. Alum for phosphorus removal is added at this point in the headworks. Flow then goes to one of two deep aeration basins constructed of concrete. Deep final clarifiers are located concentrically in the middle of each aeration basin. The wastewater in each aeration basin is circulated by pump action through a piping system located near the bottom of each aeration basin. Air is added to the pipe flow by a nozzle system located at equal quadrants around the aeration tank. The deep clarifiers are of the centerfeed variety. Effluent from the clarifiers flows by gravity to a four cell sand filter, then through an ultraviolet (UV) light system. Two banks of UV are available but only one is normally used (see Photos No. 1-8, Attachment 2). Discharge of the plant is to Lake Taneycomo via a submerged outfall. The plant is designed for a population equivalent of 6000 people. The average daily design flow is 600,000 gallons per day.

The present WWTF was placed in operation in the year 2001. It is intended to serve Rockaway Beach, Merriam Woods and Bull Creek. The new facility replaces an oxidation ditch type facility constructed in the early 1990's (see Photos No. 9-21). The previous plant facility included a headworks, an oxidation ditch, two circular final clarifiers and a large sludge holding tank. According to the Operation and Maintenance manual for the new facilities, the old treatment system oxidation ditch was to be used as an aerobic digester with the rotors being operated continuously, the two clarifiers as sludge thickeners, and the sludge storage tank was to be retained for storage. The city has a 2200 gallon sludge truck used for land application of solids. Two paved sludge drying beds were provided as an alternative to land application of liquid sludge. These beds are not now used due to slow drying times and the time required to clean them. On Tuesday morning, the MDNR personnel, Mr. Cline and Ms. Riggs, joined Mr. Godley and myself in a review of the plant and its operation. A visual inspection was performed of all the plant unit processes. A review of my findings was given to Mr. Cline on September 13, 2007.

SAMPLE COLLECTION AND ANALYSES

During the period of September 10-13, 2007, a 24-hour composite sample was collected each day from the wastewater treatment plant effluent, Outfall 001, in accordance with approved compliance sampling protocol.
The effluent sampler was initially installed to collect samples from the flow channel just downstream of the UV light boxes. During the inspection on September 11, 2001, the sand filter was observed overflowing into the final effluent channel but downstream of the sampler. The result was some flow bypassing the sand filter and the effluent sampler. As a result, the EPA sampler was moved to collect samples where all wastewater discharges into the final effluent pipe. The sampler intake tube was weighted and suspended into the final effluent flow.

The sampler was equipped with new plastic pump and plastic intake tubing which met the sampling requirements and a pre-cleaned three-gallon, plastic container for sample collection. The tubing and collection container were rinsed with effluent prior to use. The sampler was iced at the beginning of the initial sample collection period. The sampler was re-iced each time the sampler was serviced.

Samples were collected for three consecutive days. Each day, the samples for the previous 24-hour period were poured into containers for analysis, preserved as appropriate and cooled with ice to 4°C. A sample was collected each day directly from the effluent for determination of pH and temperature. The temperature and pH analysis were performed immediately on-site. The first two day's samples were returned to the EPA Region 7 Laboratory by commercial freight service using approved chain-of-custody procedures. The last day's samples were returned by me using approved chain-of-custody procedures. The daily flow was determined using the two in-plant influent Parshall flumes each with ultrasonic head detector and totalizer.

The procedures I used to calibrate the pH meter, collect, preserve, and document the samples were in accordance with the following EPA Region 7 SOPs:

SOP No. 2332.2 - NPDES Compliance Sampling Inspection
SOP No. 2334.21 - Shipping Ambient and NPDES Water Samples to the EPA Region Laboratory
SOP No. 2334.6 - Sampling Effluent for Toxicity Tests
SOP No. 2334.3 - Wastewater Sample Collection
SOP No. 2333.1 - Field Equipment Calibration and Maintenance
SOP No. 2420.6 - Sample Collection Selection, Preservation and Holding Times
SOP No. 2420.5 - Identification, Documentation and Tracking of Samples
SOP No. 2420.4 - Field Chain-of-Custody of Environmental Samples

FINDINGS AND CONCLUSIONS

The following findings were noted during the review of records, sampling, and treatment operations. A complete summary of review is given it the Water Compliance Inspection Report (Attachment 3). A Small Business Regulatory Enforcement Fairness Act Information sheet was given to Mr. Godley. A Notice of Potential NPDES Permit Violations (NOPV, Attachment 4) was reviewed with Mr. Cline and left with him. The City of Rockaway Beach's response is included as Attachment 5. The NPDES Permit is included as Attachment 6.

1. Flow is received at the WWTF through two separate metering systems. Each metering manhole contains a Parshall flume and an ultrasonic head detector connected to separate ISCO recording flow meters. The final effluent is measured by a V-notch weir and an ultrasonic head detector connected to a separate ISCO recording flow meter. These meters have not been calibrated for several years. The head detector for the combined Merriam Woods-Bull Creek flow was not mounted at the proper location of the converging section of the Parshall flume. The Rockaway Beach flow meter gave a negative head reading at zero flow suggesting that the flow reading on the meter may be less than the actual flow. The head detector at the effluent was unaffected by changes in the actual flow depth. All three meters appear inaccurate. Accurate flow measurement is required by the NPDES Permit. This deficiency was cited in the Notice of Potential Permit Violations (NOPV).

2. Drive belt covers were not on some mechanical equipment in the pump building and in the blower building (see Photos No. 22 & 23). This is a safety hazard that should not be tolerated. Completion of any repair to equipment should include replacement of all safety equipment.

3. Subsequent to the EPA inspection, MDNR provided on-site operator assistance. During this assistance it was found that three of five motive pumps, used for aeration tank circulation, were non-operational. It was also determined that the anoxic basin submerged mixer units were not working. The sand filter backwash pumps were also found to be non-functional. During this EPA inspection, the operator was asked about the normal operation of the plant, but Mr. Godley didn't identify any non-functioning equipment. Prior to this inspection, Mr. E.C. West had identified one of the blower motors operating backwards. It was re-wired to operate properly and was in operation during the EPA inspection.

4. The Number 1 aeration blower, in use at the time of EPA inspection, has a stuck air release valve. When the weights were removed during the inspection, the valve failed to release air. This broken valve subjects the blower to high internal pressure if a blockage in the aeration line occurs. This could cause the blower to suffer mechanical damage or failure. The broken or "stuck closed" valve was cited in the NOPV.

5. The two combination aeration tanks/clarifiers are located on a common headworks. The east (more southeast) unit had not been operated in more than three years. Vegetation was growing in the bottom of the aeration tank (see Photo No. 24). E.C. West reports that in July 2007, a tree was growing out of the tank. The tree was approximately 15 feet high but had been removed at the time of the EPA inspection. At the time of inspection, Mr. Godley could not verify the operability of this unit. The second aeration/clarifier serves as a standby unit to the one in service but because of anticipated rapid growth, the second treatment unit should be readily available for treatment use. Failure to maintain the aeration tank/clarifier in operable condition was cited in the NOPV.

6. Because the sand filter backwash pumps had failed previously and not been repaired, the sand filters became plugged. The operator routinely diverted the clarifier effluent around the sand filters directly into the UV light channel. However, on the 2nd day of the inspection, September 11, the sand filters were being used. The sand filters failed to pass all the flow. As a result, the filters overflowed directly into the discharge channel (see Photo No. 25). As a result, this flow didn't pass through the UV light bank. This is a bypass as defined by Standard Conditions to the NPDES Permit, Part 1, Section B(5). Mr. Godley was advised of the requirement to provide a telephone report to the Southwest Regional Office of MDNR within twenty-four hours and a written follow-up within five days. This was not done. Based upon the condition of the sand filters and related equipment, any use of the sand filters would result in a bypass that would require reporting to MDNR. There were no records to establish the filters being used or any resultant bypass.

7. A review was made of the UV system. Light bank A was operating but the bulb operation status could not be determined. The light intensity meter showed only thirty percent. Mr. Godley was asked what the light intensity was when the bulbs were new. He stated that the intensity was about ninety percent. When I asked how often the bulbs were cleaned, Mr. Godley stated that the bulbs had a wiper system that ran automatically. On the day of the inspection, the UV message center stated that the wiper system had failed. When Mr. Godley attempted to light the second UV bank, the operational indicator lights flashed, then went off. It appeared that the UV light system was poorly functioning. The last valid fecal coliform sample, collected by MDNR had a count of over 17,000 per 100 ml. The NPDES Permit limit is 1000 per 100 ml.

8. Standard Conditions to the NPDES Permit, Part I, Section A(5) requires that specific records be kept. None of the required records were available for my review. The failure to maintain these records were cited in the NOPV.

9. The NPDES Permit requires that composite samples be collected for the BOD, TSS and the Whole Effluent Toxicity (WET) tests. The operator only collects grab samples for any test performed. Mr. Godley stated that several aliquots were collected for the WET test. However, the number of samples collected and the

time interval between samples is unknown as no records were kept of the sampling performed. This sampling deficiency was cited in the NOPV.

10. The test equipment and procedures used to determine total ammonia as N and total phosphorus as P failed to meet the test requirements specified in 40 CFR 136.3. Both test procedures require digestion as an initial step which is not being done. These test deficiencies were cited in the NOPV.

11. Process control tests are required as stipulated in 10 CSR 20, Chapter 9 and are incorporated into the NPDES Permit by reference. These tests are not being performed for the Rockaway Beach WWTF at the required frequency. This deficiency in operational control testing was cited in the NOPV.

12. Special Condition in the NPDES Permit, Part C(8) requires semi-annual reports on measures taken to locate and eliminate sources of inflow and infiltration into the city's collection system. These reports are due with the April and October Discharge Monitoring Reports (DMR's). These reports are not being provided with the DMR's. This reporting deficiency was cited in the NOPV.

13. Standard Conditions to the NPDES Permit, Part III, Section K(2)(a) requires an annual submittal of a sludge report by January 28 of the following year. The sludge report for year 2006 was not filed. Failure to file this report was cited in the NOPV.

14. During the EPA inspection, Mr. Godley signed a statement (Attachment 7) which states that neither he nor a contract laboratory performed the NPDES Permit required BOD or TSS analysis. Mr. Godley, later during the inspection, stated that neither he nor a contract laboratory determined by analysis the biochemical oxygen demand (BOD), total suspended solids (TSS), potential hydrogen ion (pH), fecal coliform (FC), total phosphorus as P (TP), ammonia as N (NH3-N), and oil and grease (O&G) as required by the NPDES Permit, although monthly reports with values were filed with the MDNR. This falsification of data by Mr. Godley was cited in the NOPV.

15. The sludge reports (Attachment 8) for the years 2002 through 2005 were used to develop Table 1. The sludge report for calendar year 2006 had not been compiled or submitted even though it was due to MDNR by January 28, 2007. Mr. Godley provided a record of the amount of sludge hauled and the related percent solids for 2006. Mr. Godley also provided an estimate of the population currently contributing to the facility. Mr. Godley said that the number of people being served by the WWTF had steadily grown. The estimated population growth was redistributed evenly from year 2002 to 2006 to recalculate an estimate of the amount of sludge contribution per capita. Because an abnormally low percent solids value was measured in 2006, an average of the previous two years was assumed and used to generate a new value. The recalculated values strongly suggest that during the years 2005 and 2006, less sludge per capita was generated

TABLE 1
Summary of Sludge Reports

Sludge Report

Year	Dry Ton	Percent Solids	Population	Lbs per Capita per day	Pathogen[1] MPN/CFU
2002	14.1	1.63	600	0.129	2,090,000
2003	15.0	1.49	600	0.137	2,780,000
2003 Adj.			(950)	(0.086)	
2004	19.0	2.13	600	0.174	4,060,000
2004 Adj.			(1300)	(0.08)	
2005	19.3	2.93	620	0.171	1,840,000
2005 Adj.			(1650)	(0.064)	
2006	7.58	1.15	2000	0.02	unknown
2006 Adj.		(2.53)		(0.046)	

1. The allowable limit for land application, as stated in the Federal Regulation [40 CFR 503.32 (b)(2)], is 2,000,000 MPN/CFU.

and/or hauled than in previous years. The sludge either wasn't generated or wasn't hauled. If it wasn't hauled then it should be in storage, but sufficient information wasn't available to demonstrate that the sludge was in storage. A strong speculation is that the sludge was lost in the effluent. This speculation is supported by the operating condition of the plant and the visual appearance of the UV channel.

16. Table 1 also includes the pathogen reduction tests required for sludge application land. The pathogen limit is 2,000,000 MPN/CFU. In many years, this limit was exceeded but sludge was applied to land anyway.

17. Special Condition in the NPDES Permit, Part C(2), requires that the outfall be clearly marked in the field. The present marking, an 001 painted on the manhole lid of the last manhole before the outfall enters Lake Taneycomo, provides little identification to the average citizen (see Photos No. 26 & 27). The intent of the requirement is to provide a warning of the nature of this discharge. The average citizen would derive little or no understanding of the intent of the number 001 on a manhole cover located in an overgrown ground cover environment. This deficiency was included in the NOPV.

18. The Rockaway Beach WWTF laboratory was also reviewed (see Photos No. 28-30). The pH meter was unplugged and the buffer solution left in the beaker had dried up. This solution dried to yellow crystals suggesting to me that the solution was initially pH7 buffer. The dissolved oxygen meter temperature sensor had failed. The drying oven and muffle furnace appeared very clean and were unplugged suggesting minimum usage. The balance did not have a certification statement affixed to it suggesting that it had not been checked for proper operation. The storage room contained usable equipment but the equipment and supplies were not readily available due to poor organization of the room.

19. A standby portable electrical generator is located at the WWTF (see Photo No. 31). The purpose of the generator was not clearly defined by the operator. He said that he was considering locating it at the sand filter building. The location of use of this generator should be determined and any needed connectors supplied to make the generator usable.

20. Two petroleum fuel tanks are located on the WWTF grounds. One is an elevated 500 gallon diesel fuel tank and the other is a 300 gallon gasoline fuel tank which is sitting on the ground (see Photos No. 32 & 33). Neither tank has secondary containment.

21. The analytical results from EPA sampling are found in Attachment 9. The BOD samples do not exceed the permit limit of 30 mg/l weekly average. The suspended solids also do not exceed the permit limit of 30 mg/l weekly average. The NPDES Permit does not limit ammonia until September 1, 2009. However, total phosphorus is limited by the NPDES Permit to a monthly average of 0.5

mg/l. The three consecutive days of grab samples for phosphorus were 1.57 mg/l, 1.27 mg/l and 0.93 mg/l. Composite samples for phosphorus were 1.57 mg/l, 1.29 mg/l and 0.94 mg/l. All of these phosphorus values exceeded the NPDES Permit limit.

RECOMMENDATIONS

1. The facility must come into compliance with the NPDES Permit limit for total phosphorus.

2. All treatment equipment must be made operable. All motive pumps, backwash pumps and anoxic zone mixers must be repaired to a fully operational status. The frozen air release valve and air blower No. 1 must be repaired.

3. The ultraviolet light system must be made fully functional, including the bulb wiper system. The UV light intensity must be increased to assure that the effluent meets the NPDES Permit fecal coliform limit.

4. All BOD and TSS samples should be collected as composites at a frequency that demonstrates continued compliance with the NPDES Permit effluent limits. Frequency of sample collection should be 2 to 3 times per week. Influent composite samples should also be collected to demonstrate the plant continuously achieves 85% removal of BOD and TSS.

5. Flow meters should be repaired as needed and calibrated. Plant personnel calibration checks should be performed quarterly and an outside service person should calibrate the flow meters annually.

6. A preventative maintenance program should be implemented.

7. Wastewater analysis should be performed by a certified laboratory. Submittal of the monthly DMR to MDNR should include letterhead data report(s) from the certified laboratory performing the analysis.

8. Sludge testing required by 40 CFR 503 should be performed before any sludge is land applied. All sludge test results should meet permit limits.

9. A sludge management plan should be developed and implemented by the City of Rockaway Beach. The plan should allow a basic accounting of all sludge wasted from the clarifier(s) and the amount of sludge hauled. A total solids test for the sludge hauled should be determined every day that hauling occurs.

10. The intended use of the portable generator should be established and a plan of use established.

11. The fuel tanks should have secondary containment if they will remain in service. Otherwise, it should be confirmed that the tank(s) are empty and labeled that they are empty and in storage.

Joseph Joslin
Environmental Engineer
Activity Number: WJF0734
Date: NOVEMBER 5, 2007
Attachments

1. WWTF Location Map (1 page)
2. Photos (33 pages)
3. Water Compliance Inspection Report (EPA Form 3560-3, 4 pages)
4. Notice of Potential Violation (NOPV, 4 pages)
5. Rockaway Beach response to NOPV (6 pages)
6. Rockaway Beach NPDES Permit (7 pages)
7. Statement by Edwin Godley (2 pages)
8. Sludge Reports Years 2002-2005 (49 pages)
9. EPA Sample Analysis (7 pages)

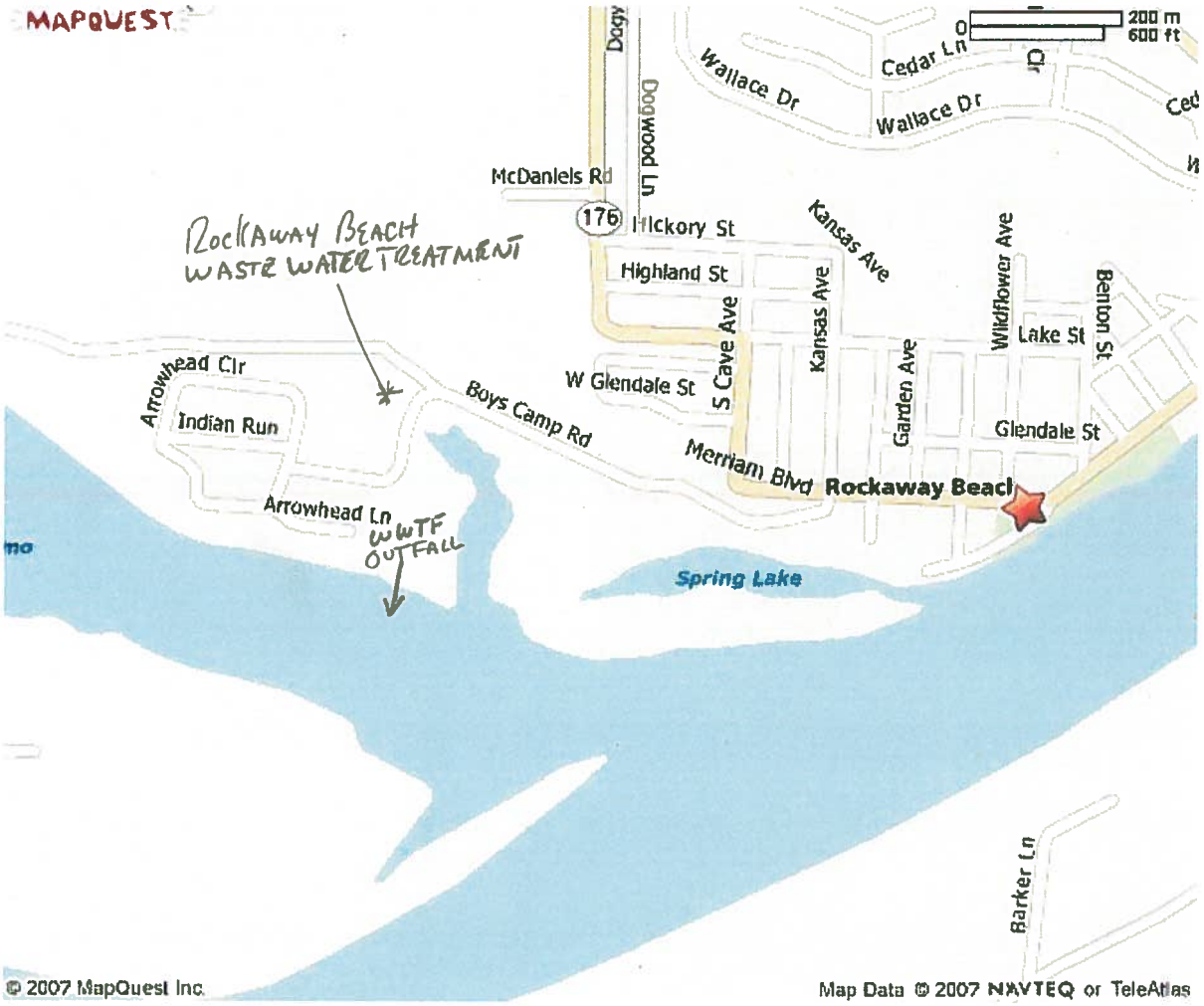
Attachment 1

MAPQUEST

Rockaway Beach MO
US

Notes:

ROCKAWAY BEACH WASTEWATER
TREATMENT FACILITY
1000 BOYS CAMP ROAD,
ROCKAWAY BEACH, MISSOURI



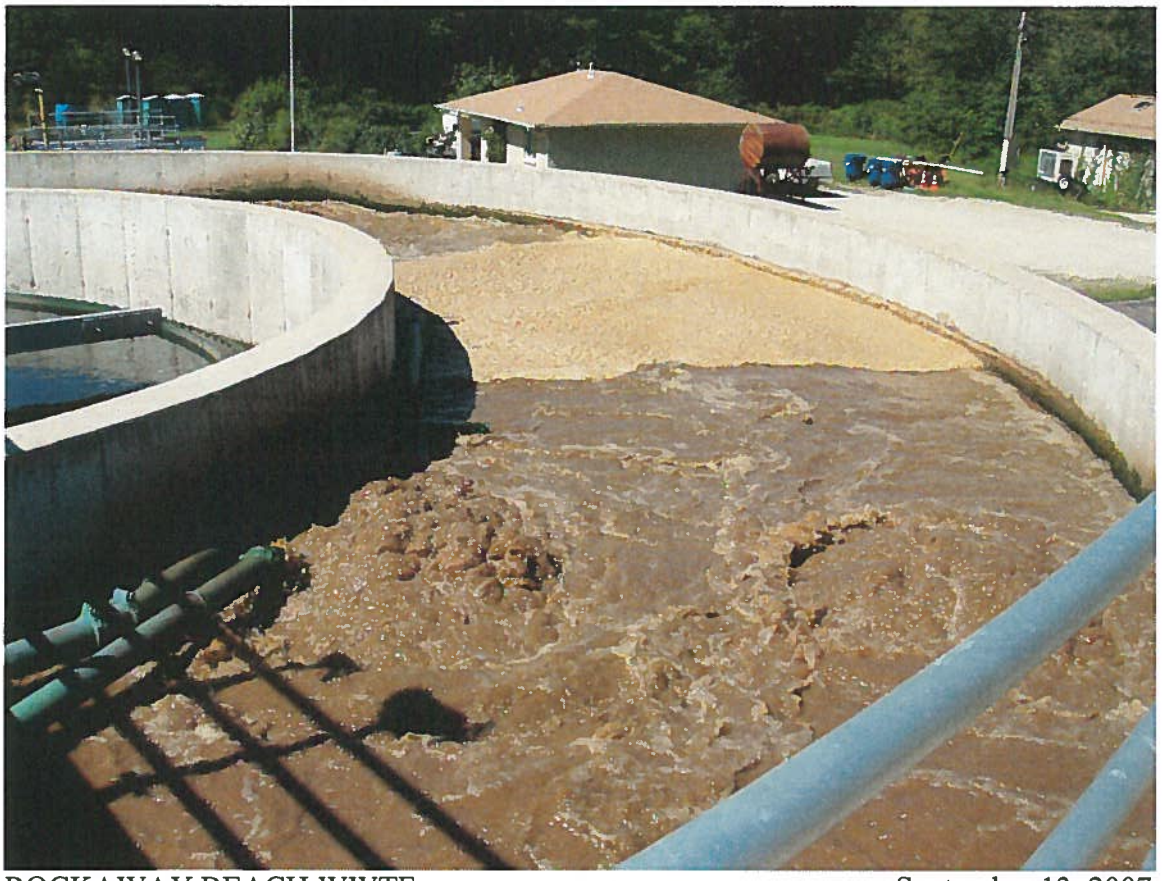
Attachment 2

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 1 This photo was taken looking northwest from the influent headworks located between the two aeration tanks. The photo shows the anoxic basins. The building in the upper left of the photo is the laboratory/office. The silver pipe at the top of the photo carries material from the mechanical bar screen to a container on the ground.

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 2 This photo was taken looking northwest from the influent headworks located between the two aeration tanks. The photo shows the upper end of the mechanical bar screen. The pipe to carry the screenings to a container on the ground is located at the right of the unit.

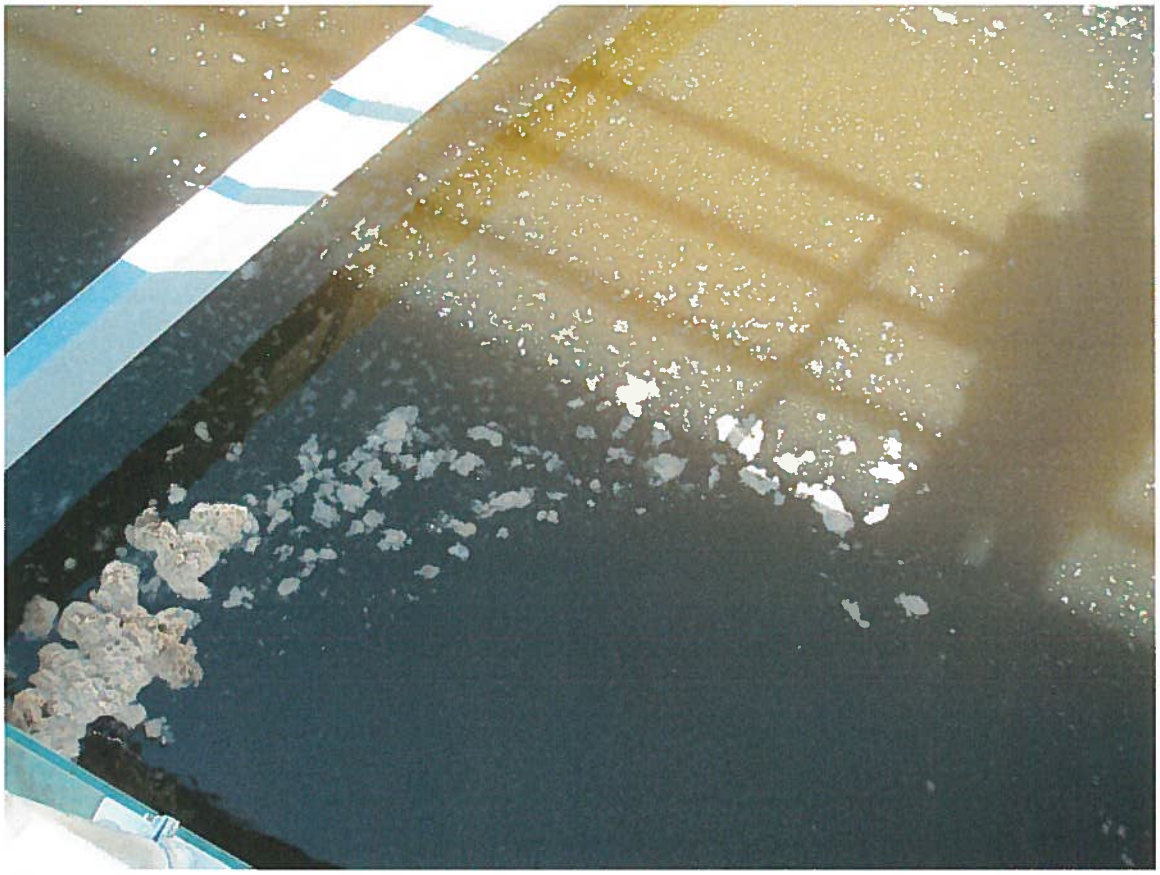


ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 3 This photo was taken looking northwest from the headworks structure looking at the west aeration basin. Note the large boil type aeration pattern. A fine bubble pattern would add more air. The building at the upper center is the laboratory/office. Located at the right edge of the photo is the raw sewage pump building.

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 4 This photo was taken looking west at the west aeration basin. The photo was taken from the final clarifier bridge. The aeration bubble was large indicating coarse bubble diffusion resulting in poor oxygen transfer.



ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 5 This photo was taken looking down at the surface of the final clarifier. Floating surface scum is visible.

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 6 This photo was taken looking at the clarifier surface skimmer of the new clarifier not in use.

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 7 This photo was taken inside the sand filter building. Visible are three of the four sand filter basins used to remove solids before the ultraviolet light disinfection channel. The sand filters are not in use in this photo.

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 8 This photo was taken on the east outside the sand filter building. This photo was taken looking down at the ultraviolet light banks. The lights are submerged in water. The number of bulbs lit cannot be determined by eye.

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

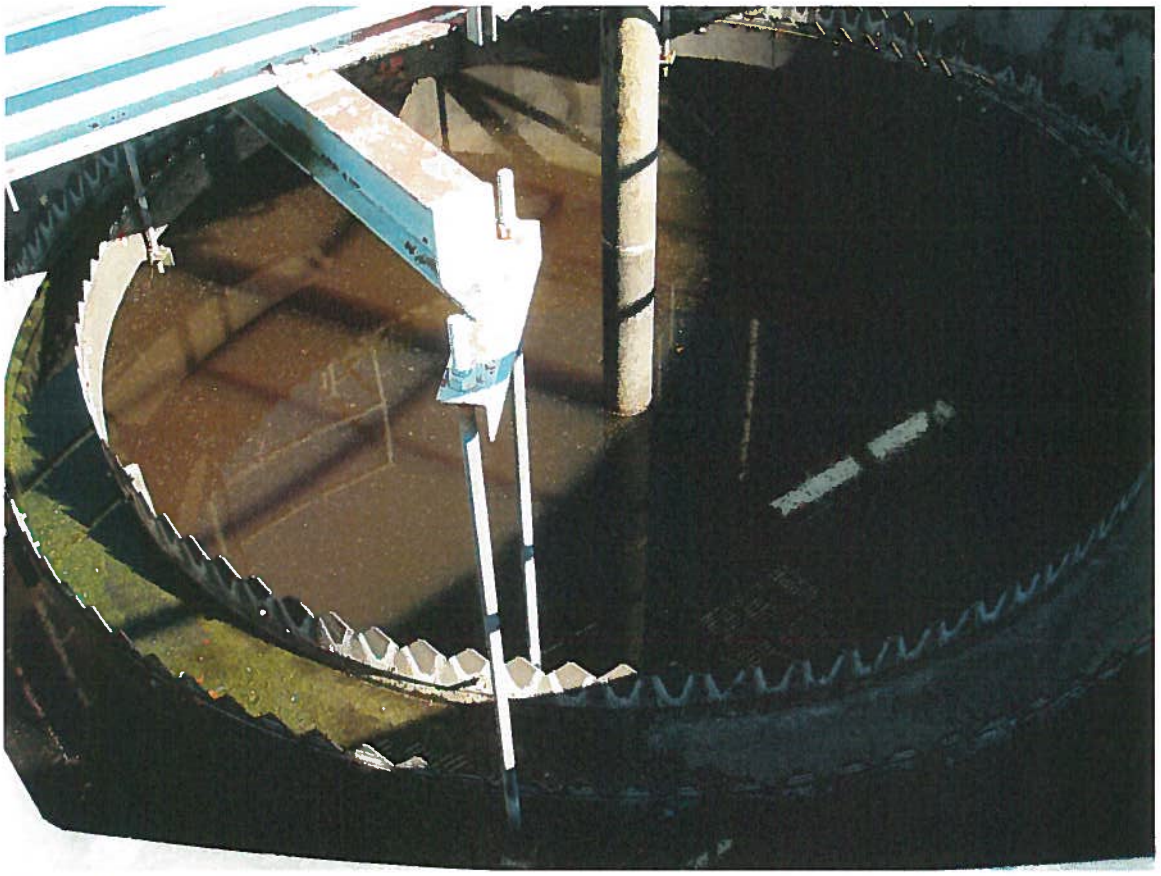
Photo no. 9 This photo looks northwest and shows the old oxidation ditch which was to be used as an aerobic digester. The design intent was to run the aerators continuously. Because of odor complaints, the rotors are not normally operated.

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 10 This photo was taken looking northwest from the west final clarifier access bridge. The photo shows the sludge storage tank at the left of the photo. The two final clarifier tanks associated with the old plant are shown at the center right. The plant design intent was to use these clarifiers as gravity thickeners then store the sludge in the sludge storage tank. These tanks are currently used as storage with no regard to sludge thickening.

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 11 This photo was taken from the old sludge storage tank looking north. It shows the two old final clarifiers that were intended to be used as sludge thickening tanks They are used as such with the water decanted manually using a pump. The sludge is pumped from these tanks into the liquid sludge haul truck which can be seen at the upper right.



ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

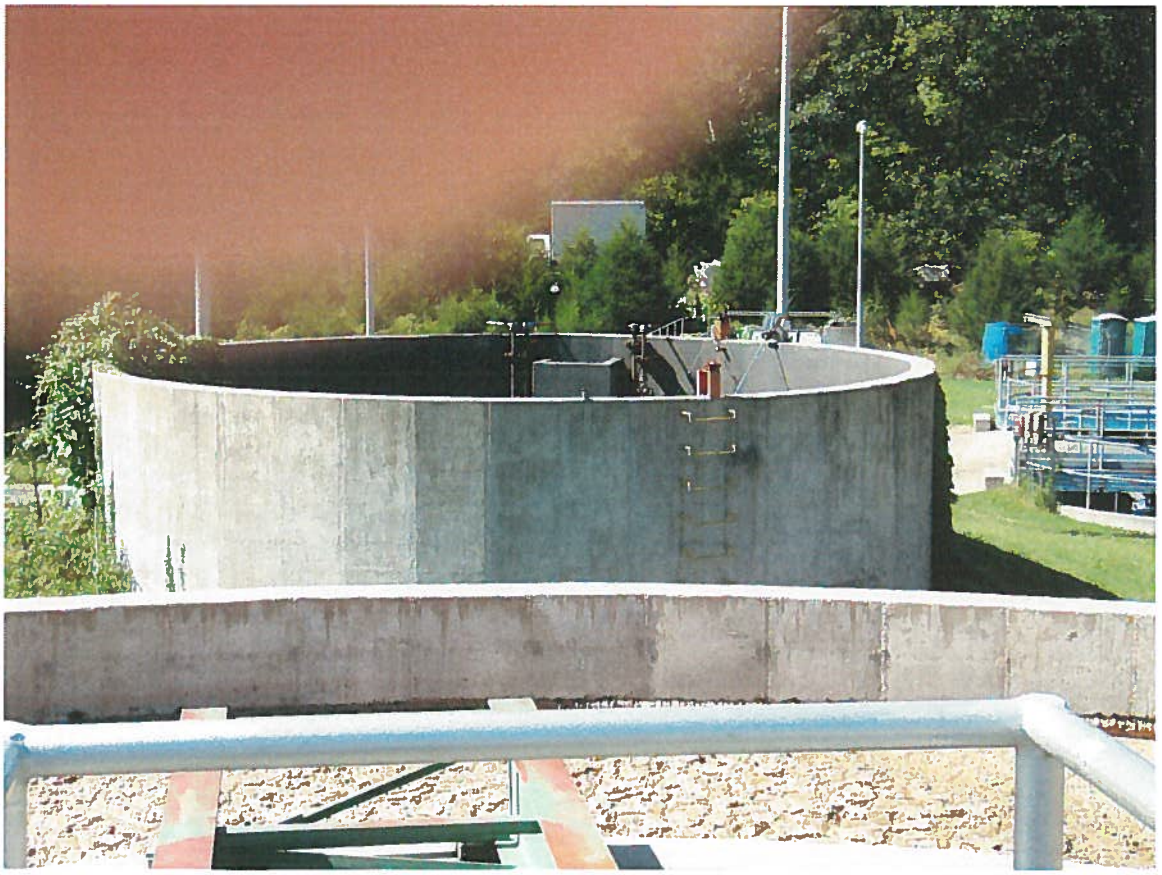
Photo no. 12 This photo was taken from the top of one of the old final clarifiers. The visual appearance of the clarifier suggests that it is not being used as a gravity sludge thickening unit but more as a storage basin.

ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 13 This photo was taken looking northwest from near the old final clarifier. Some water could be decanted from the clarifier surface.

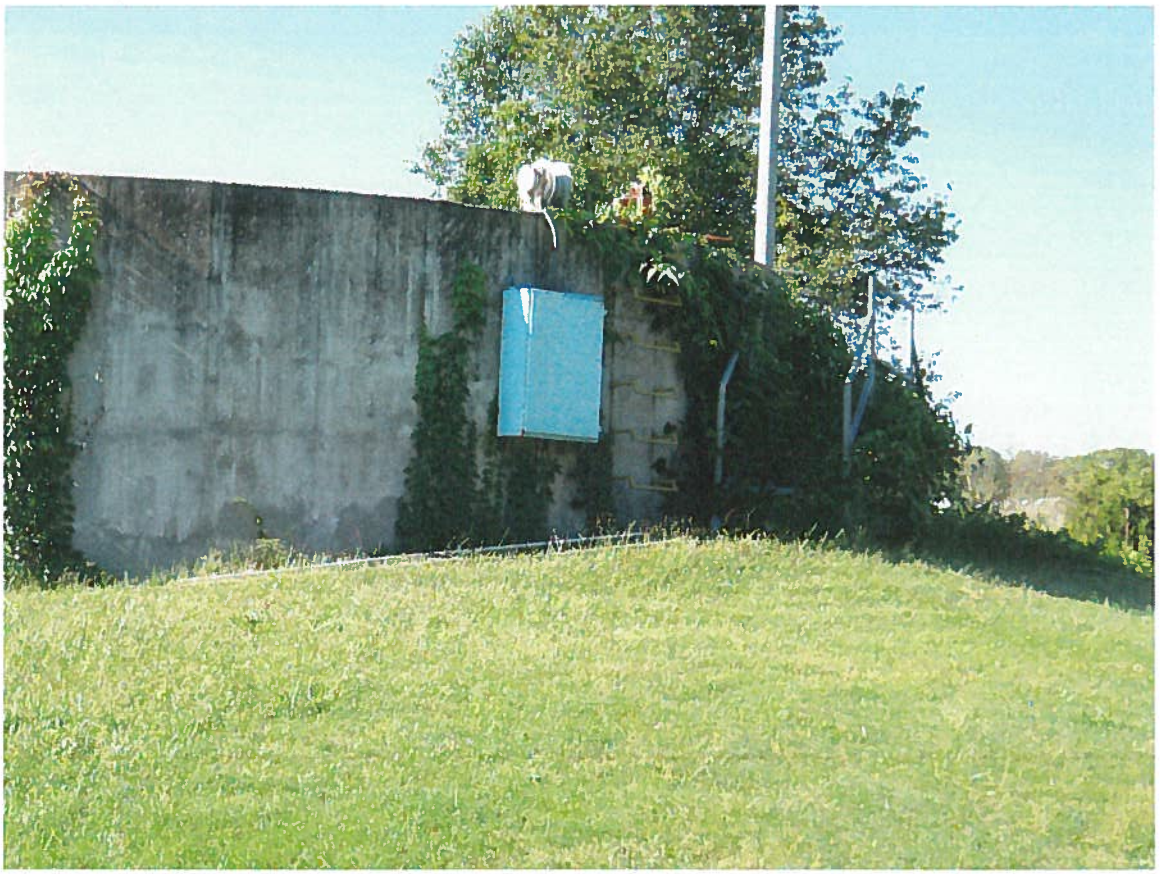
ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 14 This photo was taken looking northwest at one of the old final clarifiers.



ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 15 This photo was taken looking northwest from the west final clarifier access bridge. The upper center of the photo shows the sludge storage tank. This tank has not been used since the new plant was constructed.



ROCKAWAY BEACH WWTF September 13, 2007
Rockaway Beach, MO.

Photo no. 16 This photo was taken from near the new treatment tanks looking west at the old sludge holding basin. The access stairs have grown up in vines that limit access to the unit. Access is not an operator concern since he doesn't use the tank for sludge storage.